Claim Amendments

Please amend claims 1, 3, 4, 5, 15, 16, 26, 30 and 31 as follows:

Please cancel claim 2 as follows:

Please add new claims 32 and 33 as follows:

Listing of Claims

1. (currently amended) A method for selectively planarizing a radiation sensitive polymer layer to improve a subsequent etch<u>back</u> process comprising the steps of:

providing a substrate comprising a first density of semiconductor features and a second density of semiconductor features wherein said first density is greater than said second density;

forming at least one radiation sensitive polymer layer having a first thickness topography to cover said semiconductor features;

~~determining~~ <u>measuring</u> a thickness of the first thickness topography;

<u>determining a radiant energy transmittance distribution based on said measured first thickness topography to produce a second thickness topography;</u>

exposing the at least one radiation sensitive polymer layer

through a mask having [[a]] said ~~pre~~determined radiant energy transmittance distribution to selectively expose said polymer layer over said second density of semiconductor features to a different radiant energy dosage compared to said polymer layer over said first density of semiconductor features;

developing the at least one radiation sensitive polymer layer to produce [[a]] said second thickness topography wherein said second thickness topography covers said semiconductor features and has a higher degree of planarity than said first thickness topography; and,

~~then~~ performing an etchback process of said second thickness topography to produce a third thickness topography having substantially uniform thickness.

2. (canceled)

3. (currently amended) The method of claim 1 [[2]], wherein the first thickness topography is determined by a method selected from the group consisting ~~according to one~~ of profilometry,[[or]] interferometry,[[or]] and scanning electron microscopy[[e]].

4. (currently amended) The method of claim 1, wherein the step of exposing produces a linearly differential material removal rate in the step of developing according to the predetermined radiant energy transmittance distribution.

5. (currently amended) The method of claim 1 [[4]], wherein the step of developing is selected from the group consisting of ablation, vaporization, self-development, baking, and chemical dissolution.

6. (original) The method of claim 1, wherein the mask comprises subresolution features with a predetermined density distribution.

7. (previously presented) The method of claim 6, wherein the subresolution features are selected from the group consisting of lines, holes and islands.

8. (previously presented) The method of claim 1, wherein the mask comprises semitransparent areas with a predetermined density distribution.

9. (canceled)

10. (previously presented) The method of claim 1, wherein the semiconductor features comprise at least one of surface protruding and surface penetrating features.

11. (previously presented) The method of claim 10, wherein the surface penetrating features comprise at least one of Via openings and trench openings.

12. (original) The method of claim 10, wherein the surface protruding features comprise at least one of gate electrodes and metal lines.

13. (previously presented) The method of claim 1, wherein the step of exposing is selected from the group consisting of alignment, stepping, and scanning.

14. (previously presented) The method of claim 1, wherein the step of exposing is selected from the group consisting of a step and repeat method, a mirror projection alignment method, a proximity alignment method, a contact alignment method, and a step and stitch exposure method.

15. (currently amended) A method for selectively planarizing a

radiation sensitive polymer layer to improve a subsequent etchback process comprising the steps of:

providing a semiconductor wafer having a process surface comprising a first density of via openings and a second density of via openings formed in a dielectric layer, said first density greater than said second density;

blanket depositing a radiation sensitive polymer layer to fill and cover said via[[s]] openings at a first thickness;

~~determining~~ measuring a thickness topography of the radiation sensitive polymer layer;

determining a desired radiant energy dosage based on said measured first thickness topography to deliver to portions of the radiation sensitive polymer layer to produce a subsequent planarized thickness topography of the radiation sensitive polymer layer;

providing an exposure mask for delivering the desired radiant energy dosage;

selectively exposing portions of the radiation sensitive polymer layer through the exposure mask to deliver the desired radiant energy dosage including a relatively higher radiant energy dosage to an area of said polymer layer overlying said second density;

developing the radiation sensitive polymer layer to produce the subsequent planarized thickness topography wherein said planarized thickness topography comprises a thickness portion above and covering said via[[s]] openings; and,

~~then~~ performing an etchback process of said planarized thickness topography to form via plugs at a substantially uniform height ~~least partially filling~~ within said via[[s]] openings.

16. (currently amended) The method of claim 15, wherein the step of exposing produces linearly differential radiation sensitive polymer layer thickness change rates in the step of developing according to the desired radiant energy dosage.

17. (previously presented) The method of claim 15, wherein the step of developing is selected from the group consisting of ablation, vaporization, self-development, baking, and chemical

dissolution.

18. (original) The method of claim 15, wherein the exposure mask comprises subresolution features with a predetermined density distribution.

19. (original) The method of claim 15, wherein the exposure mask comprises semitransparent areas with a predetermined density distribution.

Claims 20-24 (canceled)

25. (previously presented) The method of claim 15, wherein the steps of determining a thickness topography through the step of developing the radiation sensitive polymer layer are repeated to form said subsequent planarized thickness topography.

26. (currently amended) The method of claim 1, wherein the etchback process produces via plugs ~~at least partially filling vias~~ within via openings, said via[[s]] openings formed in a dielectric layer.

27. (previously presented) The method of claim 1, wherein said

first thickness is within a thickness window to produce a linear change in thickness with respect to said predetermined radiant energy transmittance distribution in the step of developing.

28. (canceled)

29. (previously presented) The method of claim 15, wherein said first thickness is within a thickness window to produces a linear change in thickness with respect to said desired radiant energy dosage in the step of developing.

30. (currently amended) A method for selectively planarizing a radiation sensitive polymer layer to improve a subsequent etchback process comprising the steps of:

providing a substrate comprising a first and second density of semiconductor features;

forming a radiation sensitive polymer layer having a first thickness topography to cover said semiconductor features; ~~said first thickness topography within a thickness window sufficient to produce a linear change in thickness with respect to a desired radiant energy dosage in a subsequent development process;~~

~~then~~ measuring said first thickness topography according to a method selected from the group consisting of profilometry, interferometry, and scanning electron microscopy;

~~then~~ determining ~~said~~ a desired radiant energy dosage of said polymer layer based on said measured first thickness topography to produce a second thickness topography ~~with respect to a desired radiant energy dosage~~ in a subsequent development process;

~~then~~ exposing the radiation sensitive polymer layer through a mask to provide said desired radiant energy dosage; and,

~~then~~ developing the ~~at least one~~ radiation sensitive polymer layer in said subsequent development process to produce [[a]] said second thickness topography wherein said second thickness topography has a higher degree of planarity than said first thickness topography.

31. (currently amended) The method of claim 30, further comprising an etchback process of said second thickness topography to form a third thickness topography having a

substantially uniform thickness.

32. (new) The method of claim 1, wherein said substantially uniform thickness is below an upper surface of said semiconductor features.

33. (new) The method of claim 15, wherein the first thickness topography is determined by a method selected from the group consisting of profilometry, interferometry, and scanning electron microscopy.